

ENERGY-MODULATING FIBER GRATING SENSOR

ABSTRACT OF THE DISCLOSURE

This invention relates to a new technique of interrogating fiber grating sensors employed for measuring physical quantities such as temperature and force. The technique involves the edge filtering of transmitted light that occurs when a narrow bandwidth light of suitable wavelength from a laser source is passed through a Long Period Fiber Grating (LPFG). When the characteristics attenuation spectrum of the LPFG is shifting, an energy modulation effect will be achieved when one measures the intensity of the transmitted narrow bandwidth light. The narrow bandwidth strong light is best obtained by the reflection of a broad band light from a fiber Bragg gratings (FBGs). If the reflected narrow band spectrum from the FBGs is kept constant while the LPFG is subjected to temperature changes, applied loading or other type of suitable physical quantity changes, the characteristic transmission spectrum of the LPFG will shift according to the applied physical quantity, thus modulating the eventual transmitted light intensity. By transforming this intensity into a voltage signal, the variation of the physical quantity concerned can be deduced. Conversely, if the attenuation spectrum of the LPFG is kept constant and the FBG is subjected to temperature changes, applied loading or other type of suitable physical quantity changes, the same modulation effect will be achieved and the physical quantity concerned can likewise be monitored.